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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/630,777	08/02/2000	Tetsuro Kawahara	Q60204	8005

7590 04/10/2003

Sughrue Mion Zinn MacPeak & Seas PLLC  
2100 Pennsylvania Avenue NW  
Washington, DC 20037

EXAMINER

FERGUSON, LAWRENCE D

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

09/630,777

Applicant(s)

KAWAHARA ET AL.

Examiner

Lawrence D Ferguson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. This action is in response to the RCE mailed January 24, 2003. Claim 1 was amended rendering claims 1-2 and 4-9 pending.

***Claim Rejections – 35 USC § 103(a)***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue, et al. EP 0 901 991 A2 in view of Murasawa et al (U.S. 5,547,823).

4. EP '991 discloses a photocatalytic glass pane high in photocatalytic activity with at least one layer formed on at least one major surface of the glass substrate and at least one layer has an outer layer made of photocatalytic titanium oxide (paragraph 0005 through 0007). EP '991 discloses at least one first interlayer and at least one second interlayer made of aluminum oxide, tin oxide or zinc oxide (paragraph 0015, lines 1-5). EP '991 discloses the titanium oxide layer directly formed on a glass substrate (paragraph 0018, line 17). EP '991 discloses the titanium oxide film with a thickness of 135nm (paragraph 0019, line 43) and the aluminum oxide film having a

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thickness of about 70nm (paragraph 0026, line 55). EP '991 discloses a titanium oxide film formed on the aluminum oxide film (paragraph 0027, line 58). Although EP '991 does not explicitly disclose the films as n-type semiconductor films, they both include semiconductor materials comprising solid crystalline material having electrical conductivity greater than insulators but less than good conductors, such as titanium and aluminum. EP '991 does not disclose zirconium oxide or the band gap of the primer layer.

Murasawa teaches a first layer provided on a substrate and a second layer with photocatalytic activity layer on the first layer where the first layer comprises zirconium oxide (column 5, lines 4-18). Murasawa further teaches a photocatalytic composite having a band gap energy (column 6, lines 16-22). EP '991 and Murasawa are analogous art because they are from the field of photocatalytic articles. It would have been obvious to one of ordinary skill in the art to include the zirconium oxide in the primer layer of EP '991 because Murasawa teaches the primer layer comprising the zirconium oxide enables a firm connection between the substrate and the second layer containing the photocatalytic particles resulting in a firmer adhesion of the photocatalytic layer onto the substrate (column 5, lines 7-12). Neither reference explicitly discloses an energy band gap of the two layers. Even though Inoue is silent towards the amount of energy band gaps, the claimed band gaps are directly related to the specific semiconductor films used. Since the reference uses the same zirconium oxide and film as the photocatalyst and primer films, respectively, the energy band gap of these films would be expected to be the same as applicant's claims. Since the films are arranged in

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the same manner as applicant claims to make an article having photocatalytic activity as applicant claims, any other features afforded would be expected to occur, absent a showing of unexpected results.

***Claim Rejections – 35 USC § 103(a)***

5. Claim 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue, et al.

EP 0 901 991 A2 in view of Murasawa et al (U.S. 5,547,823) further in view of XP 002151982 and EP 08 20 967 A1.

6. EP 0 901 991 A2 in view of Murasawa et al. are relied upon for claims 1-2 and 4-6. Inoue, EP '991, does not disclose an alkali diffusion preventive film.

XP '982 teaches an alkali barrier film and a photocatalyst film on a glass substrate. All of the cited references are analogous art because they are from the same field of photocatalytic films. It would have been obvious to one of ordinary skill in the art include the alkali barrier layer interposed between the glass pane and first interlayer of EP '991 to prevent contamination of photocatalytic film so the photocatalytic activity would not be affected.

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~~None of the above references teach a hydrophilic film. EP '967 teaches a glass~~  
substrate with a film of a photocatalyzer such as TiO<sub>2</sub> (abstract) and a hydrophilic film (abstract and page 2, lines 48-55). All of the references are analogous art because they are from the same field of photocatalytic films. It would have been obvious to one of

ordinary skill in the art to include the hydrophilic film in the on the photocatalyst film of EP '991 to cut down fogging of the films.

### ***Response to Arguments***

7. Arguments made in regards to rejection under 35 USC 103(a) as being unpatentable over Inoue et al EP 0 901 991 A2 are moot based on grounds of new rejection. Additionally, arguments made in regards to rejection under 35 USC 103(a) as being unpatentable over Inoue et al EP 0 901 991 A2 in view of XP 002151982 and EP 08 20 967 A1 are moot based on grounds of new rejection.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Ferguson whose telephone number is (703) 305-9978. The examiner can normally be reached on Monday through Friday 8:30 AM – 4:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on (703) 308-0449. Please allow the examiner twenty-four hours to return your call.

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The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for

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After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2351.



Lawrence D. Ferguson  
Examiner  
Art Unit 1774



CYNTHIA H. KELLY  
SUPERVISOR, PATENT EXAMINER  
TECHNOLOGY CENTER 1700